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and complicated problem to the point of actual solution; and I must be content with bringing forward my personal contribution of matters of fact to this important inquiry, of a kind to require that they be taken into account in forming an adequate theory of this disease. In the meantime, whether the *Simulium* theory be finally justified or not, it should be especially welcome to us, as I intimated in the beginning, as giving us motive and opportunity greatly to increase our knowledge of these interesting insects; and it is particularly for this reason that I have ventured to bring this imperfect discussion of a problem yet unsolved before this congress of the entomologists of the world.

STEPHEN A. FORBES

UNIVERSITY OF ILLINOIS

#### *EOANTHROPUS DAWSONI*

A MEMORABLE and crowded meeting of the Geological Society was held in Burlington House, London, on December 18, to hear a paper read "On the Discovery of a Paleolithic Human Skull and Mandible in a Flint-bearing Gravel overlying the Wealden (Hastings Beds) at Piltdown, Fletching (Sussex)," by Charles Dawson, F.S.A., F.G.S., and Arthur Smith Woodward, LL.D., F.R.S., Sec.G.S.

Four years ago Mr. Dawson noticed that a certain road had been recently mended by peculiar flints, which he traced to a shallow pit. A little later he found that the laborers had dug out a "thing like a coco-nut," the fragments of which they threw on a rubbish heap. Mr. Dawson found there a part of a human skull which he showed to Dr. Smith Woodward; they realized the importance of the discovery, but kept it secret until they had time to exhaust the pit. This took a long time, as it is under water for six months in the year. Half of a mandible was found in the undisturbed gravel close to the spot where the skull occurred.

The gravel at Piltdown rests on a plateau 80 feet above the river Ouse and at a distance of less than a mile to the north of the existing stream. Thus denudation to the extent of 80 feet has taken place since the gravel was

formed. In the gravel were found two broken pieces of the molar of a Pliocene type of elephant, a much rolled cusp of a molar of *Mastodon*, besides teeth of *Hippopotamus*, *Castor* and *Equus*, and a fragment of an antler of *Cervus elaphas*; all of which, like the human skull, were well mineralized with oxide of iron. Many water-worn iron-stained flints were obtained which closely resemble the artifacts from the North Downs near Ightham, to which the term "eoliths" is generally applied. A few implements of the characteristic Chellean type also occurred. The gravel is (archeologically) early paleolithic and (geologically) early pleistocene of about the same age as the Norfolk Forest Bed. Professor Sollas places the Chellean industry in the second genial episode of the Ice Age, but the artifacts of Ightham type, and the remains of elephant and mastodon were doubtless derived from an Upper Pliocene deposit.

Although the cranium is very fragmentary, the pieces recovered so abut on one another that an accurate contour of the brain case can be obtained, and a cast could be made of the cavity, which reveals the broad features of the brain. The cranium is typically human, and has a capacity of at least 1,070 c.c. It measures about 190 mm. in length from the glabella to theinion, and 150 mm. in width at the widest part of the parietal region. The bones are remarkably thick, the average thickness being 10 mm. The forehead is prominent and not receding as in the Neanderthal cranium, and the brow ridge is feeble; the occipital bone shows that the tentorium over the cerebellum is on the level of the external occipital protuberance, as in modern man. The temporal muscles extended higher up on the skull than in any recent or fossil man. When viewed from behind it is seen that the cranium is surprisingly broad and low. The mastoid processes are small. There do not appear to be any characters in the cranium which can not be matched severally in various existing human skulls. No facial bones were discovered. The right half of the mandibular ramus is nearly complete to the symphysis and lacks only the articular condyle and the

upper part of the bone in front of the molars. The horizontal ramus is slender, and resembles in shape that of a young chimpanzee (*Anthropopithecus niger*). The lower symphyseal border is produced into a broad flat junction with that of the opposite side, being in this respect completely simian. The ascending ramus is broad, with extensive insertions for the temporal and masseter muscles, and has a very shallow sigmoid notch. Molars 1 and 2 are typically human, though they are somewhat large and narrow; each bears a fifth cusp; their cusps have been worn perfectly flat by mastication. The mandible is certainly the most remarkable feature of the find; although it bears some general resemblance to the Heidelberg jaw, it differs in being less massive, with smaller molars, a still more negative chin, and the simian symphysis. In making a model of the restored jaw Dr. Smith Woodward found he had too much room for the missing teeth and consequently was forced to leave a diastema between the canines and premolars, but on other grounds he believes that the canines were not specially prominent. The jaw as restored is wonderfully like that of a chimpanzee. Thus we have a being with what is virtually a human cranium and a simian jaw. The weakness of the mandible, the slight prominences of the brow-ridges, the small backward extent of the origin of the temporal muscles, and the reduction of the mastoid processes suggest that the specimen belongs to a female individual, and it may be regarded as representing a hitherto unknown species of man for which not only a new species but a new genus must be erected—Dr. Woodward bestowed on it the name of *Eoanthropus Dawsoni*.

Mr. Dawson gave an account of the finding of the specimens, the nature and geographical and geological position of the gravel bed and Dr. Smith Woodward described the remains in a most excellent manner. He pointed out that the skull of *Eoanthropus* was very different from that of *Homo monstrieriensis* (*H. neanderthalensis*), and that it bore some resemblance to the skull of a young chimpanzee. He suggested that as the characters of the

adult male chimpanzee's skull diverged considerably from the juvenile characters, so possibly *H. monstrieriensis* may have diverged from a type like *Eoanthropus*. Professor G. Elliot Smith was called on to give an account of his investigation on the cast of the cranial cavity, and he pointed out that, while the general shape and size of the brain was human, the arrangement of the meningeal arteries was typically simian, as was a deep notch in the occipital region; he regarded it as the most ape-like human brain of which we have any knowledge. Sir Ray Lankester, Professor A. Keith, Professor Boyd Dawkins, Mr. Clement Reid, Dr. Duckworth, Professor Waterston, Mr. Reginald A. Smith and others discussed the paper.

There can be no doubt that this is a discovery of the greatest importance and will give rise to much discussion. It is the nearest approach we have yet reached to a "missing link," for whatever may be the final verdict as to the systemic position of *Pithecanthropus erectus*, probably few will deny that *Eoanthropus Dawsoni* is almost if not quite as much human as simian. The recent discoveries of human remains in the Dordogne region and elsewhere are demonstrating that several races of man lived in paleolithic times, and we may confidently look forward to new finds which will throw fresh light upon the evolution of man.

A. C. HADDON

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THE YALE PERUVIAN EXPEDITION OF 1912<sup>1</sup>

ON Thursday, December 19, the Yale members of the Peruvian Expedition of 1912 returned to New Haven. This, the third Yale expedition to Peru, was conducted jointly by the University and the National Geographic Society, the Yale members being Professor Hiram Bingham, '98, director; Professor Herbert E. Gregory, '96, geologist; Dr. George F. Eaton, '94, osteologist, and Mr. Osgood Hardy, 1913, assistant—Mr. A. H. Bustead, the chief

<sup>1</sup>From interviews with members printed in the *Yale Alumni Weekly*.